ONE CLICK ALIGNMENT AFTER SMALL ANIMAL ILLPOSITIONED ACQUISITION

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Introduction: Small animal studies are not always acquired in perfectly controlled conditions. This leads to reconstructed images that sometimes are ill-positioned: the animal is rotated or translated from the expected position. The study must be reoriented using a manual reformatting tool until the result has the desired orientation or position.

To avoid this manual step, we propose a totally automatic procedure making use of the image principal axes and centroid, combined with an auto-registration process. The result is a correctly positioned study.

Materials and Methods: For every study, the centroid is translated to the image center, locating the image in the middle of the Field of View. Due the left-right symmetry in the transaxial plane, only the principal axis with bigger eigenvalue is used to align the image. Thus this axis becomes aligned with the image Z direction. Finally, to correctly solve the orientation in the transaxial plane, the transformed study is co-registered with a mirrored version. The result has the left-right symmetry plane in the saggital plane, and consequently the transaxial plane becomes correctly aligned.

Results: The method has been tested with 15 PET rat brain images, and the result has been validated by an expert user. All images were correctly aligned with no user intervention. This algorithm corrects illpositioned acquisitions and aligns the studies to a common orientation very quickly and with no user intervention.